CLAIMS

1. A method for filtering the noise of a sequence of digital images in video format comprising the following phases:

processing a first video image of the sequence to obtain a corresponding improved video image with reduced noise;

processing at least one pixel of a second video image of the sequence that temporally follows said first image, said phase of processing at least one pixel providing a corresponding filtered pixel and including the following operations:

selecting a first set of pixels comprising said at least one pixel and a plurality of pixels of the second video image spatially adjacent to it;

selecting a second set of pixels comprising pixels of the improved video image homologous with the pixels of said first set;

carrying out a digital filtering of a first type using pixels forming part of said first and second set to generate the filtered pixel.

2. A method in accordance with Claim 1, comprising also a phase of:

carrying out a first evaluation of motion of the at least one pixel, using pixels forming part of said first and second set; and in which said at least one pixel is such that said evaluation of motion is smaller than a first threshold value.

3. A method in accordance with Claim 1, comprising also a phase of:

processing a further pixel of said second image, said phase of processing the further pixel providing a corresponding further filtered pixel and including the following operations:

selecting a third set of pixels comprising said further pixel and a plurality of pixels of the second video image spatially adjacent to it;

selecting a fourth set of pixels comprising pixels of the improved video image homologous with the pixels of said third set;

carrying out a further evaluation of motion of the further pixel, using pixels forming part of said third and fourth set;

whenever said further evaluation of motion is smaller than said first threshold value, carrying out a digital filtering of a second type that generates the further filtered pixel by using exclusively pixels forming part of said third set.

4. A method in accordance with Claim 1, wherein each video image of the sequence is made up of a respective pixel matrix, the pixels of said matrix being associated on the basis of their respective positions with one of a set of chromatic components, and wherein said first and second set comprise pixels associated with the same chromatic component of the at least one pixel.

5. A method in accordance with Claim 4, wherein the images of the sequence are in Bayer CFA format and said chromatic components form part of the set comprising the color red, the color green and the color blue.

6. A method in accordance with Claim 5, wherein the phase of selecting the first set of pixels is carried out by means of selection matrices that differ according to the chromatic component of the at least one pixel, the selection matrices being such as to select pixels that are situated in the neighborhood of the at least one pixel and having the same chromatic component as said at least one pixel, discarding the others, the selection matrices being also identical for the chromatic components red and blue.

7. A method in accordance with Claim 1 that includes also a phase of making an estimate a statistical parameter σ_n^{GL} representative of the global noise present in said first image (Img_{n-1}), the digital filtering of the first type utilizing also said statistical parameter.

8. A method in accordance with Claim 7, comprising also the following phases:

selecting a plurality of pixels of the first image;

calculating a plurality of local estimates, calculating for each given pixel of said plurality of pixels a respective estimate of a statistical parameter representative of the local noise in present in a neighborhood of the given pixel; and wherein said estimate of the statistical global noise parameter σ_n^{GL} is obtained from said plurality of local estimates.

9. A method in accordance with Claim 8, wherein said local estimates are local variance measures.

10. A method in accordance with Claim 8, wherein said plurality of pixels comprises pixels forming part of homogeneous regions of the first image.

11. A method in accordance with Claim 1, wherein said digital filtering of the first type utilizes a subset of pixels forming part of said first and said second set of pixels, said subset being identified by means of a further selection phase carried out in accordance with a Duncan Range Test.

12. A method in accordance with Claim 3, comprising also a phase of estimating for the further pixel a further statistical parameter representative of the noise present on the pixels of said third set, said further parameter estimated also on the basis of the specific color of the further pixel, the digital filtering of the second type utilizing said further parameter.

13. A filter for reducing the noise of a sequence of images in CFA format, characterized in that said noise reduction is obtained by means of a method in accordance with claim 1.

14. An acquisition device for acquiring a sequence of digital images in CFA format, comprising a sensor for acquiring said images, said sensor comprising a CFA filter, characterized in that the sequence of images in CFA format is processed by means of a noise filtering method in accordance with claim 1.

15. A method of filtering noise from a digital video image comprising:

processing a first image to generate an improved image;

processing a second, subsequent image;

selecting a first pixel from the second image during the processing of the second image;

selecting a first set of pixels in the second image that are a predetermined spatial relationship to the first pixel;

locating a corresponding second set of pixels in the first image that correspond to the first set of pixels in the second image; and

filtering the first pixel using data from both the first set and the second set of pixels.

16. The method according to Claim 15 further including:

performing spatial filtering on the first pixel;

determining a motion component between the first set of pixels and the second set of pixels; and

carrying out a motion compensator filtering if the first motion component between the first set and the second set is above a selected threshold and not carrying out motion compensation filtering if the motion component between the first set and the second set is below a selected threshold